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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

PHAN, HANH

ART UNIT

PAPER NUMBER

2613

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/674,649	FRANCK ET AL.	
	Examiner	Art Unit	
	Hanh Phan	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,8-16,18-31 and 35-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 14-16,18-22 and 35-38 is/are allowed.
- 6) ☒ Claim(s) 1, 8-13, 23-31 and 39-44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

1. This Office Action is responsive to the Amendment filed on 11/20/2006.
2. The indicated allowability of claims 26 and 32 is withdrawn in view of the newly discovered reference(s) to Bodeep et al (US Patent No. 5,631,757) and Godstein et al (US Patent No. 5,712,864). Rejections based on the newly cited reference(s) follow.

Claim Objections

3. Claim 8 is objected to because of the following informalities:

-In claim 8, line 1, the phrase "The method of claim 3" should be changed to –
The method of claim 1--. Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 9, 11, 12, 23, 28-30 and 40-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwa (US Patent No. 5,255,111) in view of Bodeep et al (US Patent No. 5,631,757) **OR** Dietz et al (US Patent No. 7,072,587).

Regarding claims 1, 23, 28 and 40-44, referring to Figures 1 and 2, Kwa teaches a method, comprising:

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generating (i.e., electro-optic transducer means 17, Fig. 1) an optical transmit signal in response to an electrical transmit signal (i.e., col. 4, lines 10-67 and col. 5, lines 1-50);

coupling the optical transmit signal into a waveguide (i.e., optical fiber transmission 30, Fig. 1) for transmission there over;

receiving (i.e., electro-optic transducer means 27, Fig. 1) an optical receive signal from the waveguide, the optical receive signal having a same communication wavelength as the optical transmit signal (i.e., col. 4, lines 10-67 and col. 5, lines 1-50); and

generating an electrical receive signal in response to the received optical receive signal (i.e., Figs. 1 and 2, col. 4, lines 10-67 and col. 5, lines 1-50).

Kwa differs from claims 1, 23, 28 and 40-44 in that he does not specifically teach generating the optical transmit signal in response to the electrical transmit signal occurs simultaneously as generating the electrical receive signal in response to the received optical signal. Bodepp et al, from the same field of endeavor, likewise teaches full duplex data communication (Figure 4). Bodepp et al further teaches generating the optical transmit signal in response to the electrical transmit signal occurs simultaneously as generating the electrical receive signal in response to the received optical signal (i.e., Fig. 4, col. 5, lines 11-67 and col. 6, lines 1-34) **OR** Dietz et al, from the same field of endeavor, likewise teaches communication using bi-directional LEDs (Figures 4 and 5). Dietz et al further teaches generating the optical transmit signal in response to the electrical transmit signal occurs simultaneously as generating the electrical receive

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signal in response to the received optical signal (i.e., Fig. 5, col. 3, lines 15-56). Based on this teaching, it would have been obvious to one having skill in the art at the time the invention was made to incorporate the generating the optical transmit signal in response to the electrical transmit signal occurs simultaneously as generating the electrical receive signal in response to the received optical signal as taught by Bodeep et al **OR** Dietz et al in the system of Kwa. One of ordinary skill in the art would have been motivated to do this since allowing provide a light emitting diode that can be used as both a transmitter and receiver in an optical communication system, reducing the cost of the communication system and reducing the complexity of the communication system.

Regarding claim 29, Kwa further teaches wherein coupling the optical transmit signal into the single communication link (i.e., optical fiber 30, Figs. 1 and 2) comprises coupling the optical transmit signal into a single optical waveguide and wherein receiving the optical receive signal from the single communication link comprises receiving the optical receive signal from the single optical waveguide.

Regarding claim 30, Kwa further teaches wherein the optical transmit signal is generated during a transmit interval and wherein the optical receive signal is received during a receive interval, the transmit interval and the receive interval alternating back and forth (i.e., col. 4, lines 10-67, col. 5, lines 1-67 and col. 6, lines 1-50).

Regarding claim 9, Kwa further teaches the optical transmit signal and the optical receive signal simultaneously propagate along the single optical waveguide in opposite directions (Figs. 1 and 2).

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Regarding claim 11, the combination of Kwa and Bodeep et al **OR** Dietz et al teaches generating the optical transmit signal comprises directly modulating a diode and wherein receiving the optical receive signal comprises receiving the optical receive signal with the diode (Fig. 5 of Dietz et al).

Regarding claim 12, the combination of Kwa and Bodeep et al **OR** Dietz et al teaches generating the optical transmit signal comprises directly modulating a laser diode and wherein receiving the optical receive signal comprises receiving the optical receive signal with a P-I-N diode (i.e., Fig. 5 of Dietz et al).

6. Claims 8, 31 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwa (US Patent No. 5,255,111) in view of Bodeep et al (US Patent No. 5,631,757) **OR** Dietz et al (US Patent No. 7,072,587) and further in view of Akimoto et al (Pub. No.: US 2003/0039010).

Regarding claims 8, 31 and 39, Kwa as modified by Bodeep et al **OR** Dietz et al differs from claims 8 and 31 in that he does not specifically teach adjusting a bit-rate of the electrical transmit signal. However, Akimoto teaches adjusting a bit-rate of the electrical transmit signal (i.e., Fig. 1, page 6, paragraph [0073]-[0074]). Based on this teaching, it would have been obvious to one having skill in the art at the time the invention was made to incorporate the adjusting a bit-rate of the electrical transmit signal as taught by Akimoto in the system of Kwa modified by Bodeep et al **OR** Dietz et al. One of ordinary skill in the art would have been motivated to do this since allowing increasing the capacity of the optical communication system.

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7. Claims 10, 24 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwa (US Patent No. 5,255,111) in view of Bodeep et al (US Patent No. 5,631,757) **OR** Dietz et al (US Patent No. 7,072,587) and further in view of Nomura (US Patent No. 6,731,881).

Regarding claims 10, 24 and 34, the combination of Kwa and Bodeep et al **OR** Dietz et al differs from claims 10, 24 and 34 in that he does not specifically teach isolating the electrical receive signal from the electrical transmit signal with an echo cancellation circuit. However, Nomura teaches isolating the electrical receive signal from the electrical transmit signal with an echo cancellation circuit (i.e., Figs. 3 and 4, col. 6, lines 10-67 and col. 7, lines 1-60). Based on this teaching, it would have been obvious to one having skill in the art at the time the invention was made to incorporate the isolating the electrical receive signal from the electrical transmit signal with an echo cancellation circuit as taught by Nomura in the system of the combination Kwa of Bodeep et al **OR** Dietz et al. One of ordinary skill in the art would have been motivated to do this since allowing removing the signal noise and increasing the signal to noise ratio.

8. Claims 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kwa (US Patent No. 5,255,111) in view of Bodeep et al (US Patent No. 5,631,757) **OR** Dietz et al (US Patent No. 7,072,587) and further in view of Goldstein et al (US Patent No. 5,712,864).

Regarding claims 25-27, Kwa as modified by Bodeep et al **OR** Dietz et al

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differs from claims 25-27 in that he does not specifically teach a laser diode, a PIN diode and an electro-optical absorption modulator formed within the integral waveguide. However, Goldstein et al teaches a laser diode, a PIN diode and an electro-optical absorption modulator formed within the integral waveguide (i.e., Figs. 2 and 3, col. 3, lines 38-67 and col. 4, lines 1-38). Based on this teaching, it would have been obvious to one having skill in the art at the time the invention was made to incorporate the laser diode, PIN diode and electro-optical absorption modulator formed within the integral waveguide as taught by Goldstein et al in the system of Kwa modified by Bodeep et al OR Dietz et al. One of ordinary skill in the art would have been motivated to do this since allowing save space, size and cost of the system.

9. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kwa (US Patent No. 5,255,111) in view of Bodeep et al (US Patent No. 5,631,757) **OR** Dietz et al (US Patent No. 7,072,587) and further in view of Bremner et al (Pub. No.: US 2004/0264973).

Regarding claim 13, Kwa as modified by Bodeep et al OR Dietz et al differs from claim 13 in that he does not specifically teach an electro-absorption modulator. However, Bremner teaches an electro-absortion modulator (i.e., Figs. 2 and 3, pages 1 and 2, paragraphs [0015]-[0018]). Based on this teaching, it would have been obvious to one having skill in the art at the time the invention was made to incorporate the electro-absortion modulator as taught by Bremner in the system of Kwa modified by Bodeep et al OR Dietz et al. One of ordinary skill in the art would have been motivated

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to do this since allowing improving the chirp performance, low drive voltage, and small size.

Allowable Subject Matter

10. Claims 14-9, 18-22 and 35-38 are allowed.

Response to Arguments

11. Applicant's arguments with respect to claims 1, 8-16, 18-31 and 35-38 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanh Phan whose telephone number is (571)272-3035.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-4700.


HANH PHAN
PRIMARY EXAMINER